



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|-------------|----------------------|---------------------|------------------|
| 10/033,324 | 11/02/2001 | Xu Wang | 22682-06323 | 9617 |
| 758 | 7590 | 01/25/2005 | EXAMINER | |
| FENWICK & WEST LLP SILICON VALLEY CENTER 801 CALIFORNIA STREET MOUNTAIN VIEW, CA 94041 | | | CHEN, ALAN S | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 2182 | |

DATE MAILED: 01/25/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|--------------------------------------|------------------------------------|--|
| Office Action Summary | Application No. 10/033,324 | Applicant(s) WANG ET AL. | |
| | Examiner Alan S Chen | Art Unit 2182 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 November 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-30 and 35-39 is/are pending in the application.
- 4a) Of the above claim(s) 31-34 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-9, 12-26, 29, 30 and 35-39 is/are rejected.
- 7) ☒ Claim(s) 10, 11, 27 and 28 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 02 November 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date <u>1/18/2005</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:
 - I. Claims 1-30 and 35-39, drawn to method and computer program product related to data transfer specifying, classified in class 710, subclass 33.
 - II. Claims 31-34, drawn to a system related to configuration and mode selection, classified in class 710, subclass 14.
2. Inventions 1-39 are related as combination and subcombination. Inventions in this relationship are distinct if it can be shown that (1) the combination as claimed does not require the particulars of the subcombination as claimed for patentability, and (2) that the subcombination has utility by itself or in other combinations (MPEP § 806.05(c)). In the instant case, the combination as claimed does not require the particulars of the subcombination as claimed because the system in claims 31-34 comprises elements used in transferring data between two devices within a system that deal with mode selection and indicators involved in data transfer. The subcombination has separate utility such as methods that configure and enable data transfer between two devices.
3. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

Art Unit: 2182

4. During a telephone conversation with Greg Sueoka (Reg. No. 33,800) on 1/19/2005, a provisional election was made without traverse to prosecute the invention of group I, claims 1-30 and 35-39. Affirmation of this election must be made by applicant in replying to this Office Action. Claims 31-34 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Drawings

5. The drawings are objected to because they contain several items that need to be made more legible, e.g., Fig. 14, Host input register and output line label, Figs. 16, 23, 25 and 26 are difficult to discern. It is recommended that the applicant type textual labels to make them more discernable. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1-9, 12-26, 29, 30 and 35-39 are rejected under 35 USC 103(a) as being unpatentable over No. 6,209,046 to Sato et al. (hereafter Sato) in view of No. 2002/0199040 to Irwin et al. (hereafter Irwin).

Art Unit: 2182

8. As per claims 1, 12, 18 and 35-37 Sato discloses a method (claims 1,12,18 and 38) and computer program product (claims 35-37) of selectably enabling a plurality of data transfer modes along one channel (Fig. 2), loading a predetermined configuration data from an external device (paragraph 45) and indexing operation characteristics associated with the data transfer (claims 18, 35, the speed of data transfer, e.g., the different level depicted in steps of Fig. 2, e.g., step ST5), the various transfer modes are specified by the host to the hard drive, e.g., a multi-word DMA transfer mode, “Nd”, or different DMA transfer modes that represent different transfer speeds, denoted by “Ni”) facilitating data transfer (Fig. 1, data transferred from host to hard disk); receiving a command to initiate data transfer (Fig. 1, step ST1, command set signal) between a source device (host device Fig. 1, element 200) and a destination device (Fig. 1, hard disk drive controller), responsive to the command received (Fig. 1, step ST1 is in response to command, e.g., “in accordance with a command set signal”), determining a channel to send the data (data is sent over Fig. 1, element 150 bus channel) and a corresponding mode from the plurality of data transfer modes (Fig. 2, based on where errors have occurred, set the transfer mode, e.g., how fast to transfer); and enabling data transfer between the source device and the destination device based on the channel and mode (Fig. 2, ST12 data is transferred at the determined data transfer mode).

Sata does not disclose expressly being able to select from a plurality of channels to perform the DMA data transfer.

Irwin discloses performing DMA data transfers (Paragraph 37) over a plurality of channels (Fig. 1, multiple storage systems where the channel address to communicate with each must be specified). In addition, Irwin discloses the error and error mitigation in his invention (Paragraph 82).

Sata and Irwin are analogous art because they are from similar problem solving area of error management involving DMA transfers.

At the time of the invention it would have been obvious to a person of ordinary skill in the art to be able to handle multiple storage device and hence having multiple channels in the system to select from in a DMA transfer.

The suggestion/motivation for doing so would have been the ability of connect multiple storage device to a personal computer system, e.g., motherboards have at least two IDE channels and each channel can be daisy chained with at least two devices, such as two hard disk devices for storage expansion. In addition, PCI buses such as the one used by Irwin (paragraph 36) can handle more than two devices (a specified by the PCI Local bus specification, paragraph 50). The former and the latter are both well known in the art.

Therefore, it would have been obvious to combine Sata with Irwin for the benefit of storage expansion.

Art Unit: 2182

9. As per claims 2, 15 and 20, Sata discloses claims 1, 12 and 18, respectively, Sata further discloses one of the devices being a hard disk memory device (Fig. 1).

10. As per claims 3 and 19, Sata discloses claims 1 and 18, wherein Sata discloses the DMA process of ending the data transfer (Fig. 5, after step ST43).

11. As per claims 4 and 13, Sata discloses claims 1 and 12, respectively, wherein the mode is selected from a fixed length burst mode (single burst transfer) and an auto-rollback mode (when the transfer rate is reduced or rolled back, based on errors in transmission, Fig. 2).

12. As per claims 5 and 14, Sata discloses claims 1 and 12, respectively, wherein the mode can be a write DMA command (paragraph 59) or read DMA command (paragraph 31).

13. As per claims 6-9, 23-26, Sata discloses claim 1, wherein it is intrinsic that DMA transfers use standard DMA data transfer procedures, such as starting off with a base address to start transferring a segment of data from and after the segment of data is completely transferred, contiguous data segments to be send next will be transferred based on the last address where the prior segment ended.

14. As per claims 16, 17, 21, 22, 29, 30 and 39, Sata discloses claims 12, 18 and 38, wherein the source or destination device is enabled to read or write data from the destination device (read DMA command, paragraph 31, and write DMA command, paragraph 59) and it is intrinsic data transfer completion acknowledge signals occur at the end of DMA transfer (Fig. 5 after ST43).

Data transfer is occurs directly between host and hard disk as shown in Fig. 1.

Allowable Subject Matter

15. Claims 10, 11 and 27, 28 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is the statement of reasons for the indication of allowable subject matter: The prior art disclosed by the applicant and cited by the Examiner fail to teach or suggest, alone or in combination, the methods recited in claims 1 and 18, further comprising a segment count indicator and a segment spacing indicator from the operational characteristics, wherein the data transfer comprises data transfer of a plurality of data segments.

Conclusion

16. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

The following patents are cited to further show the state of the art with respect to DMA data transfer between two devices with mode selection options:

U.S. Pat. No. 6,701,405 to Adusumilli et al.

U.S. Pat. No. 5,228,130 to Michael

U.S. Pat. No. 6,523,071 to Klinger et al.

17. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alan S Chen whose telephone number is 571-272-4143. The examiner can normally be reached on M-F 8:30am - 5:30pm.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jeffrey A Gaffin can be reached on (571) 272-4146. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 2182

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

ASC

1/17/2005



KIM HUYNH
PRIMARY EXAMINER
1/19/05